EXPRESS MAIL

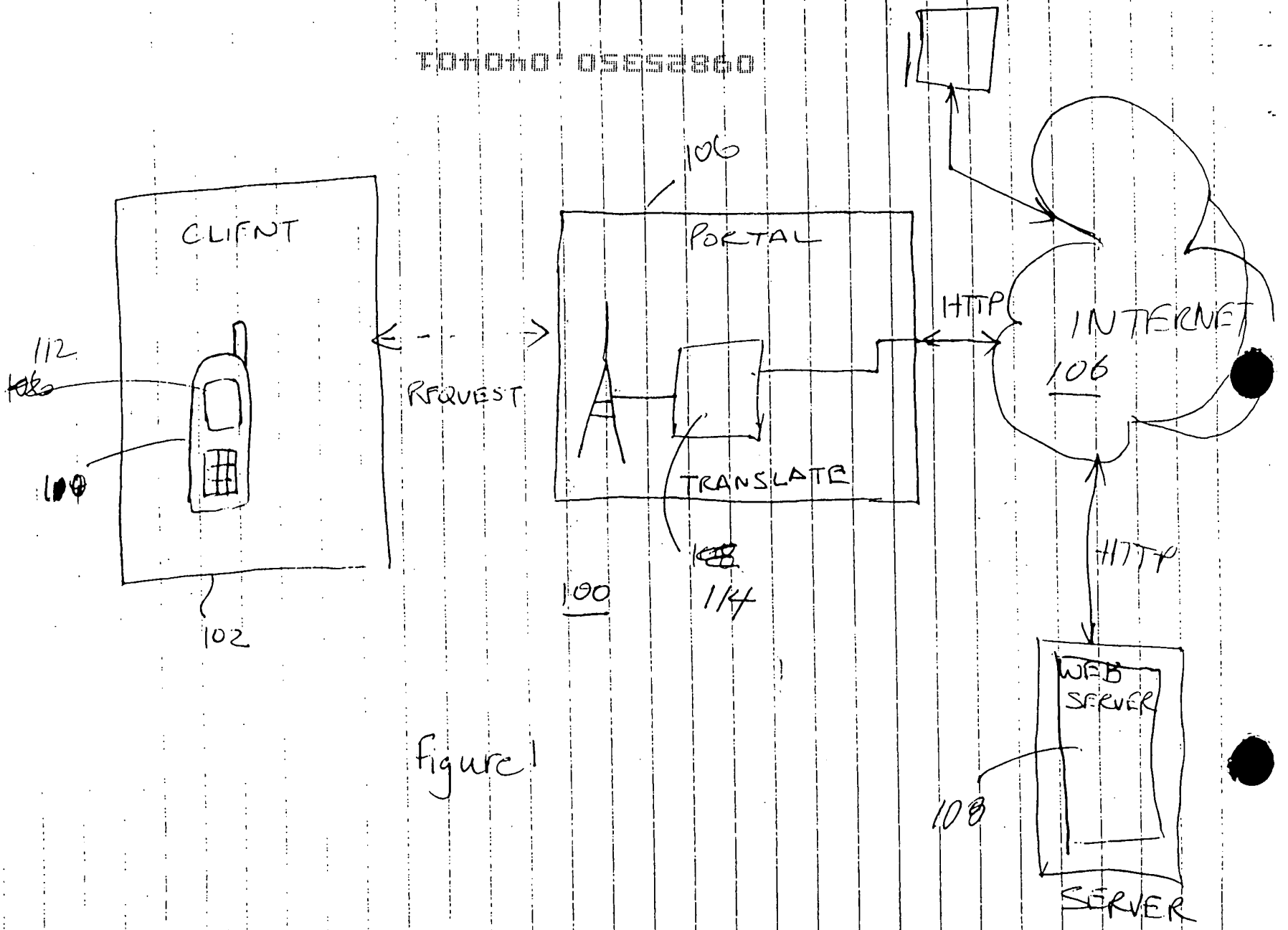

Figure 1

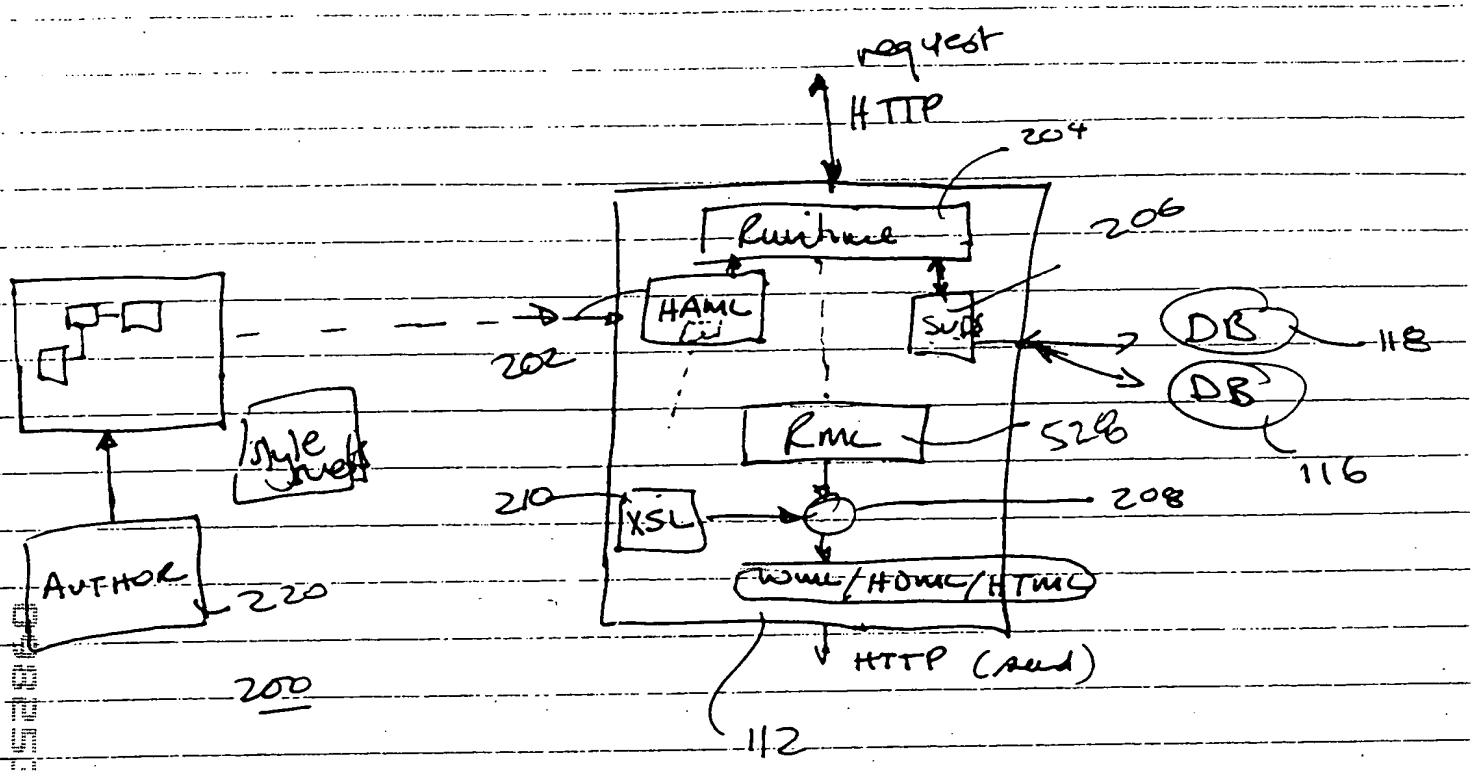
request
HTTP
204
Runtime
206
HAML
SASS
DB
118
DB
116
202
Style sheet
RMC
528
210
XSL
208
XML/HTML/HTML
HTTP (send)
AUTHOR
220
200
112

Figure 2

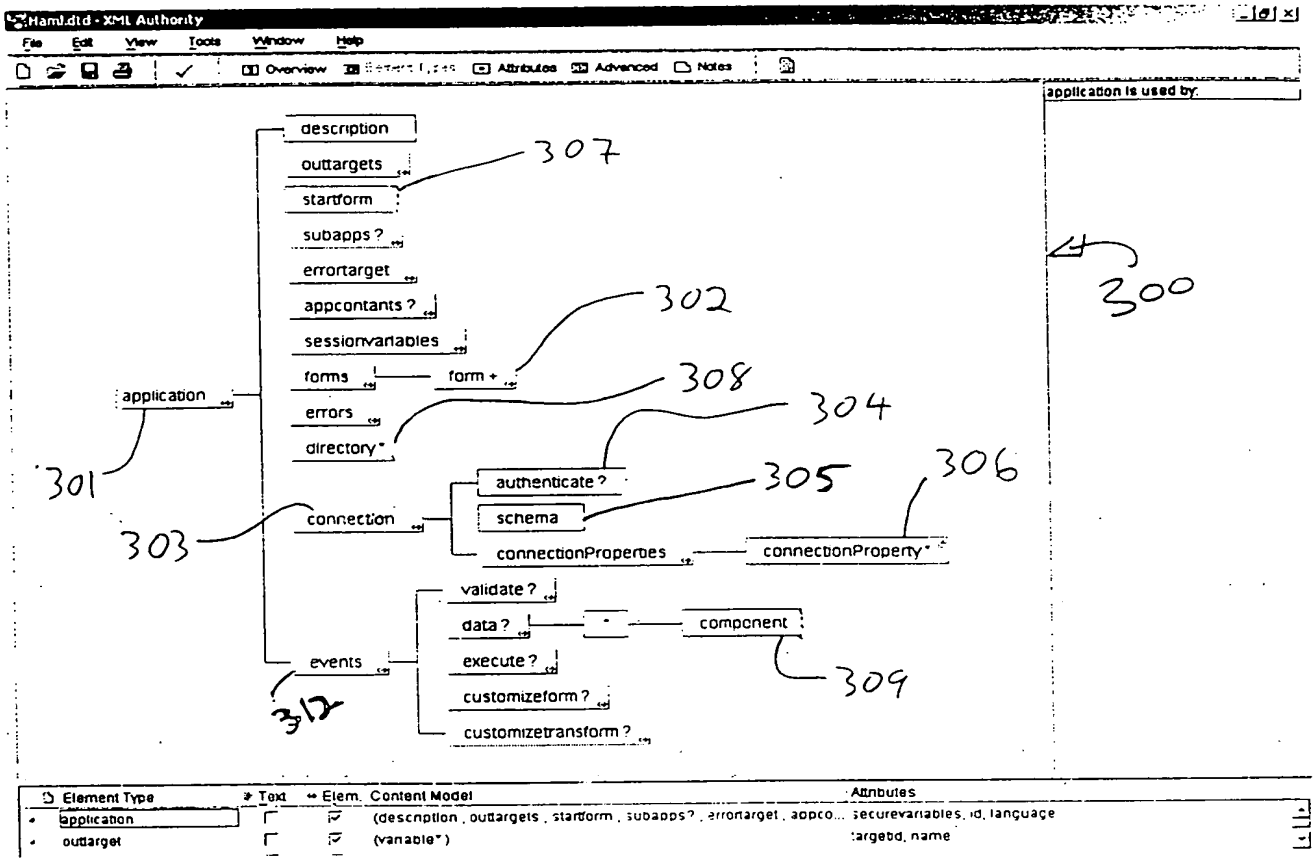
Haml.dtd - XML Authority
File Edit View Tools Window Help
Overview Attributes Advanced Notes
application is used by:
description
outtargets
startform
subapps ?
errortarget
appcontants ?
sessionvariables
forms
form +
errors
directory*
application
connection
authenticate ?
schema
connectionProperties
connectionProperty*
validate ?
data ?
component
execute ?
customizeform ?
customizetransform ?
events
307
302
308
304
305
306
301
303
309
312
300
Element Type
Text
Elem. Content Model
Attributes
application
(description , outtargets , startform , subapps? , errortarget , appco...
securevariables, id, language
outtarget
(variable*)
targetid, name

Figure 3

Patent - 05/05/2006

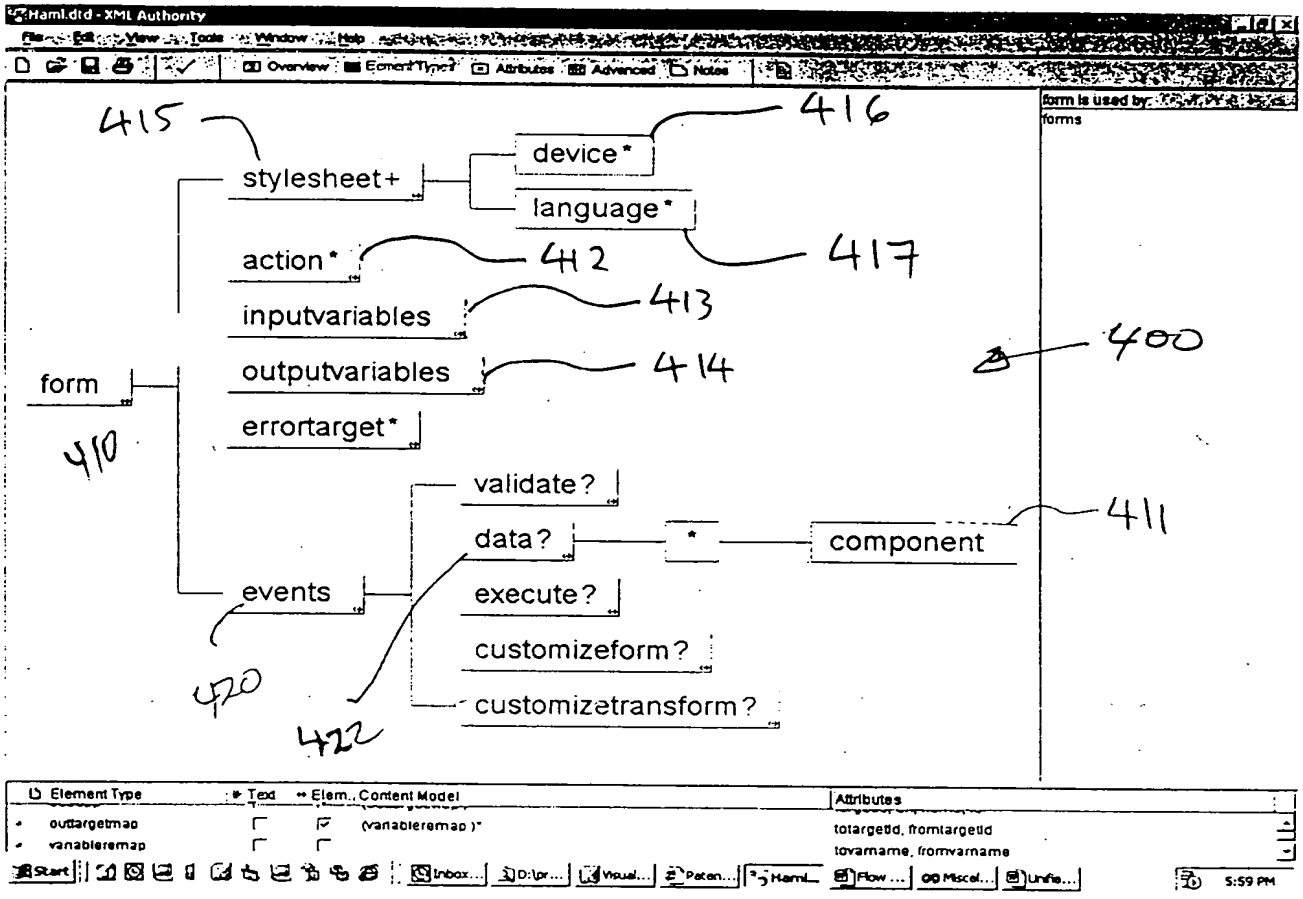

Figure 4

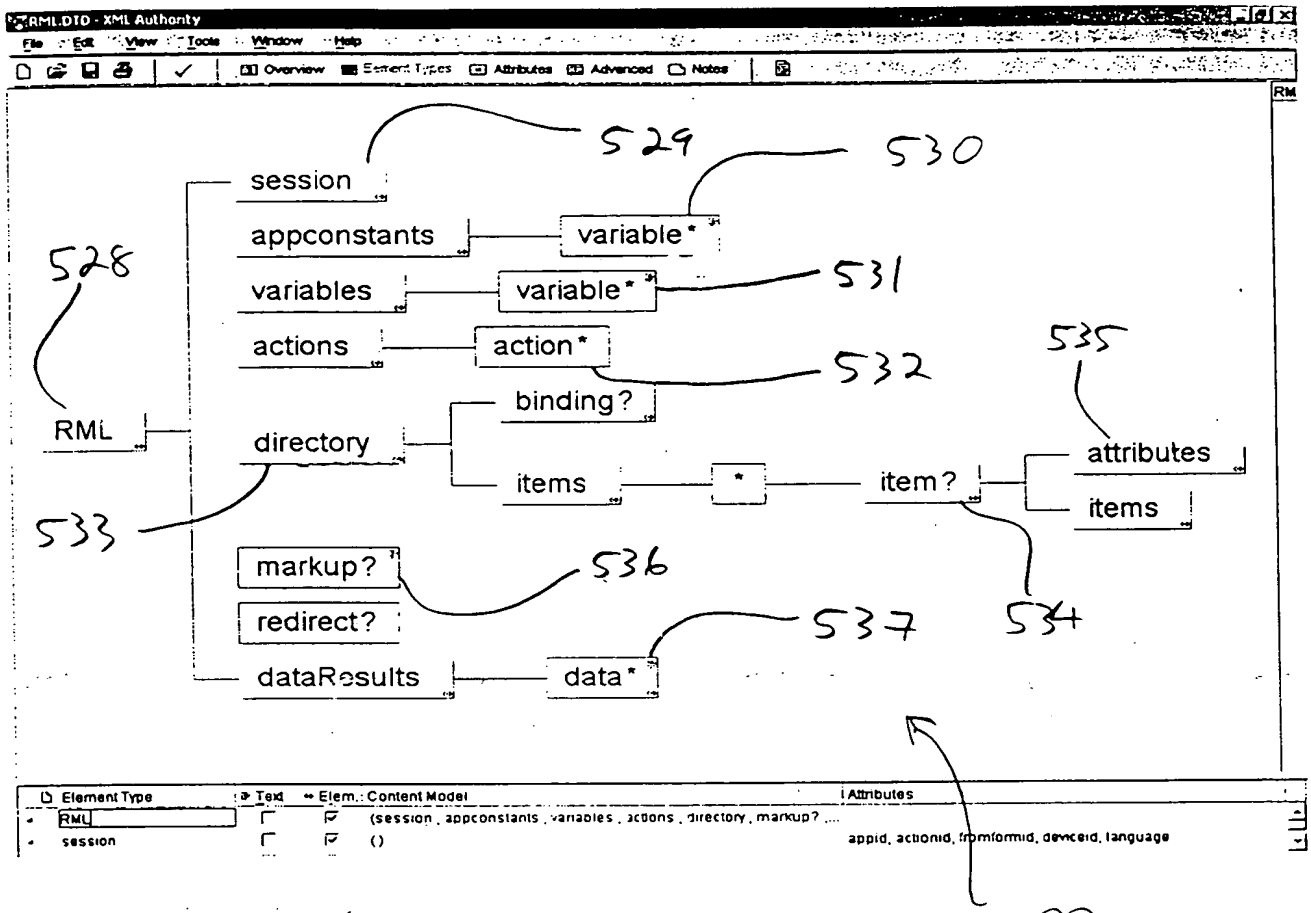
RMLDTD - XML Authority
File Edit View Tools Window Help
Overview Element Types Attributes Advanced Notes
RML
session
appconstants
variables
actions
directory
markup?
redirect?
dataResults
variable*
variable*
action*
binding?
items
*
item?
attributes
items
data*
529
530
531
532
533
534
535
536
537
528
Element Type
Text
Elem.: Content Model
Attributes
RML
session
(session , appconstants , variables , actions , directory , markup? ....
()
appid, actionid, fromformid, deviceid, language

Figure 5

500

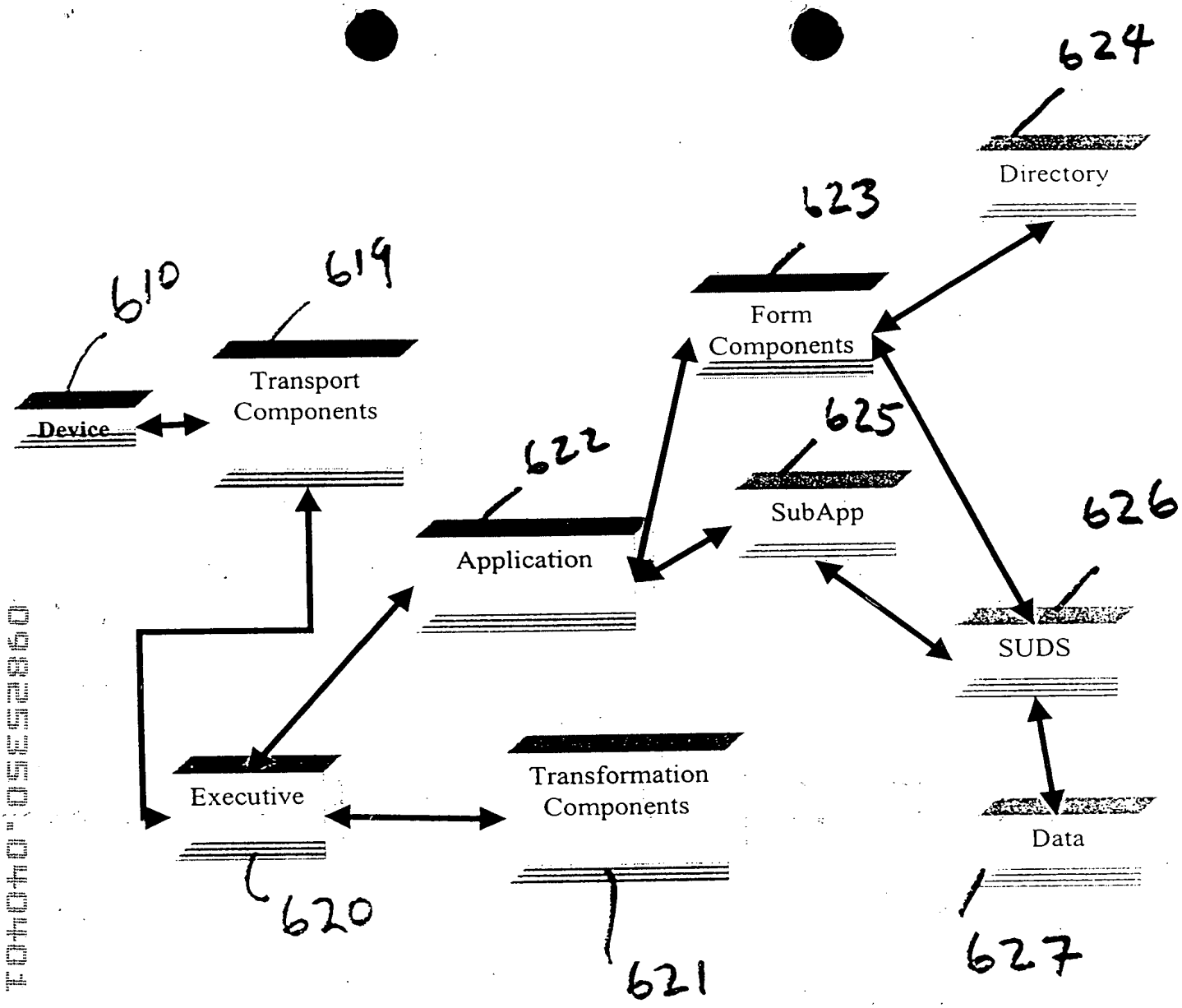
624
Directory
623
Form
Components
610
619
Transport
Components
Device
625
SubApp
622
Application
626
SUDS
Executive
Transformation
Components
Data
620
621
627

Fig 6

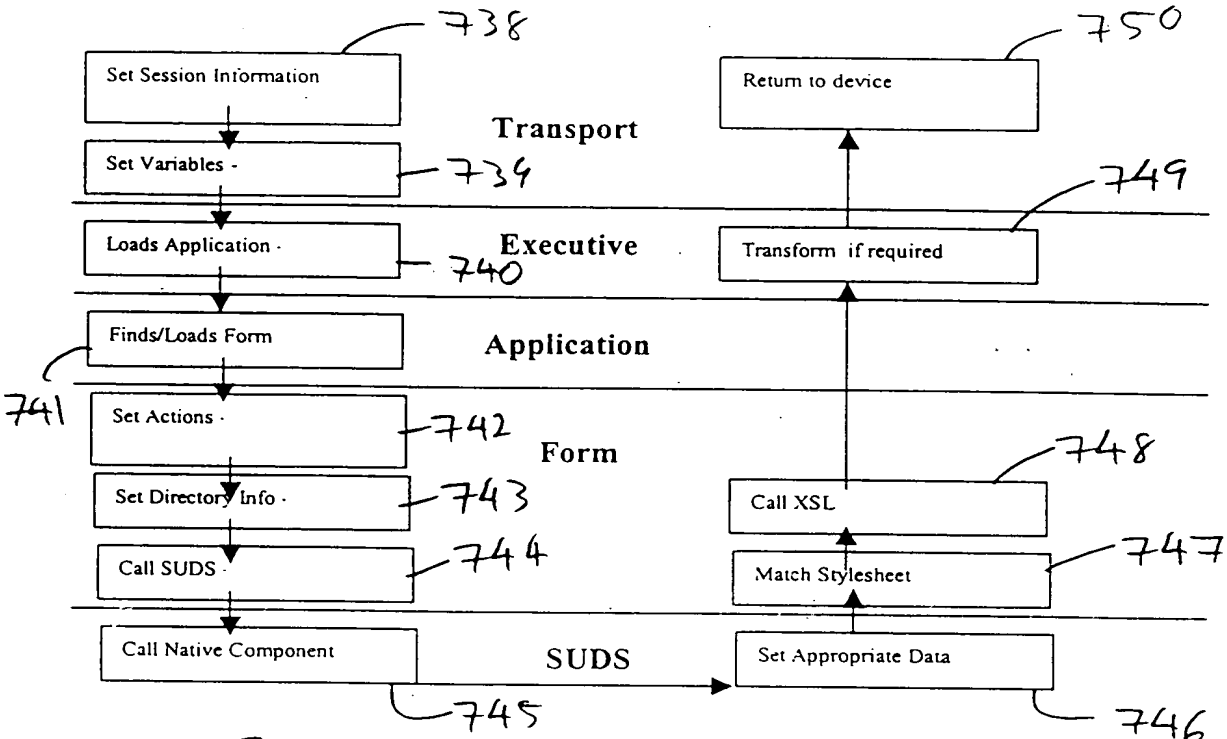
738
Set Session Information
Set Variables -
739
Transport
Loads Application -
740
Executive
Finds/Loads Form
Application
741
Set Actions -
742
Form
Set Directory Info -
743
Call SUDS -
744
Call Native Component
SUDS
745
Return to device
750
749
Transform if required
748
Call XSL
747
Match Stylesheet
Set Appropriate Data
746

Figure 7

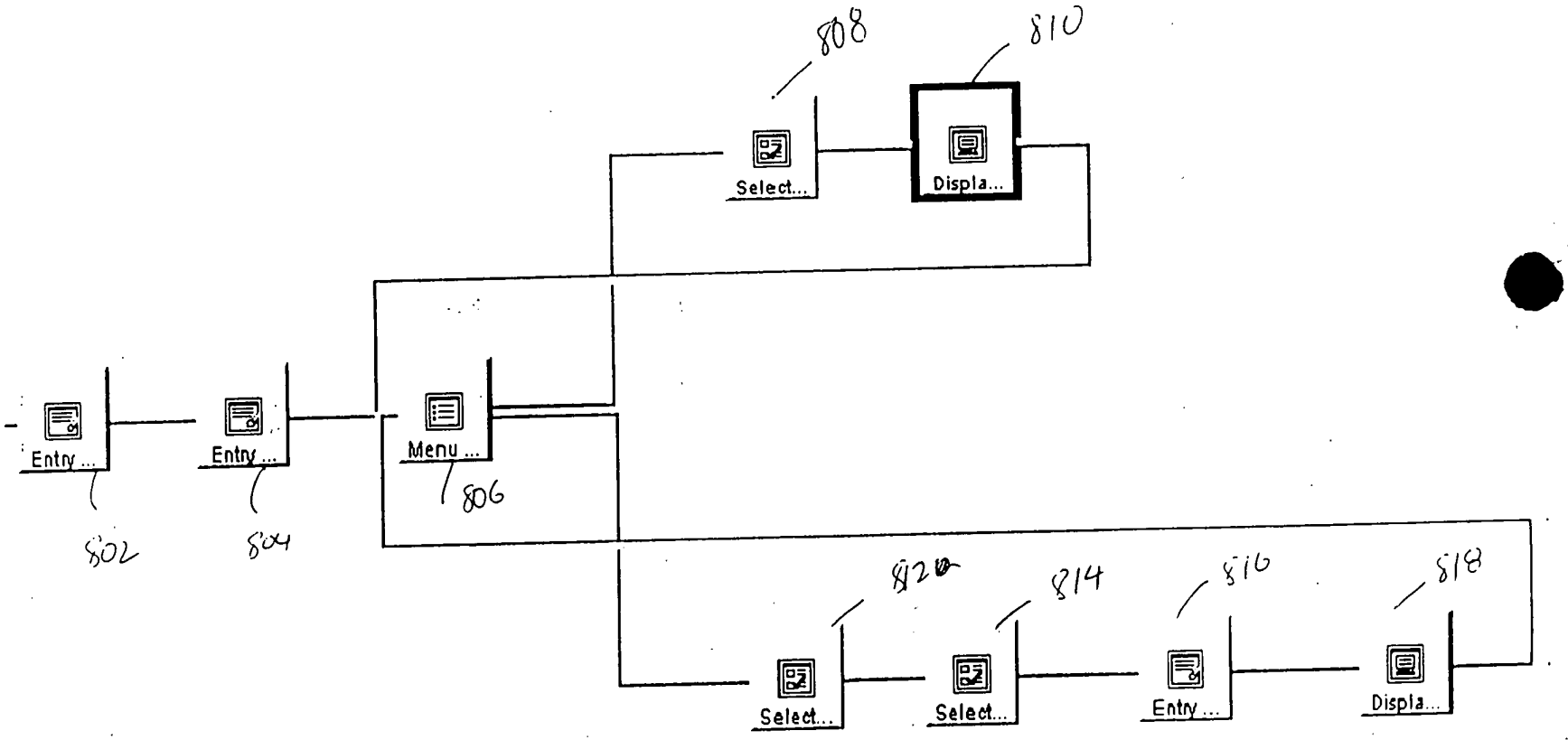
808
810
Select...
Displa...
Entry...
Entry...
Menu...
806
802
804
820
814
816
818
Select...
Select...
Entry...
Displa...

Figure 8(a)

```
<?xml version="1.0" encoding="UTF-8" ?>
- <application usecookies="false" id="{F6681A6F-FB7C-4901-855C-08791DDE8DC8}"
    securevariables="false">
    <description version="1" name="MQBanking" />
    <outtargets />
    <startform totargetid="UserID" />
    <subapps />
    <errortarget totargetid="UserID" />
  - <properties>
      <variable default="209.23.23.23" name="ServerIP" />
    </properties>
  - <sessionvariables>
      <variable name="Session" />
    </sessionvariables>
  - <forms>
    - <form targetid="UserID" includeheaders="false">
        <stylesheet contenttype="WML11" url="http://www.mobileq.com" />
        <action totargetid="Password" name="OK" />
        <inputvariables />
      - <outputvariables>
          <variable name="UserID" />
        </outputvariables>
        <events />
      </form>
    - <form targetid="Password" includeheaders="false">
        <stylesheet contenttype="WML11" url="http://www.mobileq.com" />
        <action totargetid="Main" name="OK" />
      - <inputvariables>
          <variable name="UserID" />
        </inputvariables>
      - <outputvariables>
          <variable name="Session" />
        </outputvariables>
        <events />
      </form>
    - <form targetid="Main" includeheaders="false">
        <stylesheet contenttype="WML11" url="http://www.mobileq.com" />
        <action totargetid="Account" name="Account Balance" />
        <action totargetid="Bill Payment" name="Bill Payment" />
        <action totargetid="Transfer" name="Account Transfer" />
        <inputvariables />
        <outputvariables />
        <events />
      </form>
    - <form targetid="Account" includeheaders="false">
        <stylesheet contenttype="WML11" url="http://www.mobileq.com" />
        <action totargetid="Details" name="OK" />
        <inputvariables />
      - <outputvariables>
          <variable name="AccountID" />
        </outputvariables>
```

Fig 8(6)

```
    <events />
  </form>
- <form targetid="Details" includeheaders="false">
    <stylesheet contenttype="WML11" url="http://www.mobileq.com" />
    <action totargetid="Main" name="OK" />
  - <inputvariables>
      <variable name="AccountID" />
    </inputvariables>
    <outputvariables />
    <events />
  </form>
- <form targetid="Bill Payment" includeheaders="false">
    <stylesheet contenttype="WML11" url="http://www.mobileq.com" />
    <action totargetid="Bill" name="OK" />
    <inputvariables />
  - <outputvariables>
      <variable name="AccountID" />
    </outputvariables>
    <events />
  </form>
- <form targetid="Bill" includeheaders="false">
    <stylesheet contenttype="WML11" url="http://www.mobileq.com" />
    <action totargetid="Amount" name="OK" />
  - <inputvariables>
      <variable name="AccountID" />
    </inputvariables>
  - <outputvariables>
      <variable name="BillID" />
      <variable name="AccountID" />
    </outputvariables>
    <events />
  </form>
- <form targetid="Amount" includeheaders="false">
    <stylesheet contenttype="WML11" url="http://www.mobileq.com" />
    <action totargetid="Confirm" name="OK" />
  - <inputvariables>
      <variable name="BillID" />
      <variable name="AccountID" />
    </inputvariables>
  - <outputvariables>
      <variable name="AccountID" />
      <variable name="BillID" />
      <variable name="Amount" />
    </outputvariables>
    <events />
  </form>
- <form targetid="Confirm" includeheaders="false">
    <stylesheet contenttype="WML11" url="http://www.mobileq.com" />
    <action totargetid="Main" name="Cancel" />
  - <inputvariables>
      <variable name="AccountID" />
      <variable name="BillID" />
```

Fig 8(c)

Patent Office - 05/03/2005

```
        <variable name="Am[redacted]nt" />
      </inputvariables>
    - <outputvariables>
        <variable name="AccountID" />
        <variable name="BillID" />
        <variable name="Amount" />
      </outputvariables>
      <events />
    </form>
  </forms>
  <errors />
  <events />
</application>
```

Patent Application Publication

Fig 8(d)

```
- <rml>
  - <dataresults>
    - <data name="source1">
      - <RECORDS>
        - <RECORD>
            <Blair PK="1">172-32-1176</Blair>
            <Test1 PK="1">1</Test1>
            <Test2 PK="1">2</Test2>
            <Test3 PK="1">3</Test3>
            <LastName>White</LastName>
            <FirstName>Johnson</FirstName>
          </RECORD>
        - <RECORD>
            <Blair PK="1">213-46-891</Blair>
            <Test1 PK="1">1</Test1>
            <Test2 PK="1">2</Test2>
            <Test3 PK="1">3</Test3>
            <LastName>Green</LastName>
            <FirstName>Marjorie</FirstName>
          </RECORD>
        - <RECORD>
            <Blair PK="1">238-95-7766</Blair>
            <Test1 PK="1">1</Test1>
            <Test2 PK="1">2</Test2>
            <Test3 PK="1">3</Test3>
            <LastName>Carson</LastName>
            <FirstName>Cheryl</FirstName>
          </RECORD>
        - <a>
          - <RECORD>
              <Blair PK="1">238-95-7766</Blair>
              <Test1 PK="1">1</Test1>
              <Test2 PK="1">2</Test2>
              <Test3 PK="1">3</Test3>
              <LastName>Carson</LastName>
              <FirstName>Cheryl</FirstName>
            </RECORD>
          </a>
        - <a>
          - <b>
            - <RECORD>
                <Blair PK="1">238-95-7766</Blair>
                <Test1 PK="1">1</Test1>
                <Test2 PK="1">2</Test2>
                <Test3 PK="1">3</Test3>
                <LastName>Carson</LastName>
                <FirstName>Cheryl</FirstName>
              </RECORD>
            </b>
          </a>
        </RECORDS>
```

Fig. 9 (a)

```
</data>
- <data name="source2">
  - <RECORDS>
    - <RECORD>
        <Blair PK="1">aaaaaa</Blair>
        <Test1 PK="1">1</Test1>
        <Test2 PK="1">2</Test2>
        <Test3 PK="1">3</Test3>
        <LastName>White</LastName>
        <FirstName>Johnson</FirstName>
      </RECORD>
    - <RECORD>
        <Blair PK="1">bbbbbbb</Blair>
        <Test1 PK="1">1</Test1>
        <Test2 PK="1">2</Test2>
        <Test3 PK="1">3</Test3>
        <LastName>Green</LastName>
        <FirstName>Marjorie</FirstName>
      </RECORD>
    - <RECORD>
        <Blair PK="1">cccccc</Blair>
        <Test1 PK="1">1</Test1>
        <Test2 PK="1">2</Test2>
        <Test3 PK="1">3</Test3>
        <LastName>Carson</LastName>
        <FirstName>Cheryl</FirstName>
      </RECORD>
    - <a>
      - <RECORD>
          <Blair PK="1">ddddddd</Blair>
          <Test1 PK="1">1</Test1>
          <Test2 PK="1">2</Test2>
          <Test3 PK="1">3</Test3>
          <LastName>Carson</LastName>
          <FirstName>Cheryl</FirstName>
        </RECORD>
      </a>
    - <a>
      - <b>
        - <RECORD>
            <Blair PK="1">eeeeeeee</Blair>
            <Test1 PK="1">1</Test1>
            <Test2 PK="1">2</Test2>
            <Test3 PK="1">3</Test3>
            <LastName>Carson</LastName>
            <FirstName>Cheryl</FirstName>
          </RECORD>
        </b>
      </a>
    </RECORDS>
  </data>
</dataresults>
```

Fig. 9(b)

```
- <actions>
    <action formatstring="" actionid="OK" querystring="?
      _SQRSIGN=A&_SQAPPID={B77444A1-BD9E-4248-A664-
      6C483F8B4540}&_ACTIONID=OK&_SQFORMID={8D7B4336-6341-
      4D2C-B2D8-49FE88D1B13A}&EmployeeID=$EmployeeID" />
  </actions>
- <dictionary>
    <variable />
    <variable />
  </dictionary>
</rml>
```

10/040,350 : 01/04/2002

Fig 9(c)

```
- <xsl:stylesheet xmlns:xsl="http://www.w3.org/TR/WD-xsl">
  - <xsl:template match="/">
    - <wml>
      - <head>
          <meta name="FormType" content="SQSelectForm" />
          <meta name="ListMethod" content="numeric" />
        </head>
      - <card>
          <xsl:attribute name="title">qwe</xsl:attribute>
        - <p>
          - <select>
              <xsl:attribute name="title">qwe</xsl:attribute>
              <xsl:attribute name="name">asd</xsl:attribute>
            - <xsl:for-each select="/rml/dataresults/data
                [@name='source2']//RECORD">
              - <option>
                - <xsl:attribute name="value">
                    <xsl:value-of select="Blair" />
                    z1z
                    <xsl:value-of select="Test1" />
                    z1z
                    <xsl:value-of select="Test2" />
                    z1z
                    <xsl:value-of select="Test3" />
                  </xsl:attribute>
                - <xsl:attribute name="title">
                    <xsl:value-of select="LastName" />
                    ,
                    <xsl:value-of select="FirstName" />
                    ,
                    <xsl:value-of select="/rml/data
                      [@name='source1']/RECORDS/RECORD/Blair" />
                  </xsl:attribute>
                  blah blah blah
                </option>
              </xsl:for-each>
            </select>
          </p>
        - <xsl:for-each select="/rml/actions//action">
          - <do>
              <xsl:attribute name="type">accept</xsl:attribute>
            - <xsl:attribute name="label">
                <xsl:value-of select="@actionid" />
              </xsl:attribute>
            - <go>
              - <xsl:attribute name="href">
                  <xsl:value-of select="@querystring" />
                </xsl:attribute>
              </go>
            </do>
          </xsl:for-each>
        </card>
```

Fig 10(a)

Doc# 3050-0404

```
    </wml>
  </xsl:template>
</xsl:stylesheet>
```

EPO - DG 1 05.05.2003 09

Fig 10(b)

```
- <wml>
  - <head>
      <meta name="FormType" content="SQSelectForm" />
      <meta name="ListMethod" content="numeric" />
    </head>
  - <card title="Select Account">
    - <p>
      - <select title="Select Account" name="HoldingsAccountID">
          <option value="1" title="Acct 10314">Acct 10314</option>
          <option value="2" title="Acct 11345">Acct 11345</option>
        </select>
        <br />
      </p>
    - <do type="accept" label="OK">
        <go href="?_SQRSIGN=A&_SQAPPID={8D360BDF-E570-45E9-BEC1-
          4E5DD949C5C0}&_ACTIONID=OK&_SQFORMID={BCC091A1-63D4-
          11D3-9E34-0090273EFC3B}
          &HoldingsAccountID=$(HoldingsAccountID)
          &UserID=246531&Session=1" />
      </do>
    </card>
  </wml>
```

FOHO: 05523850

Fig. 11

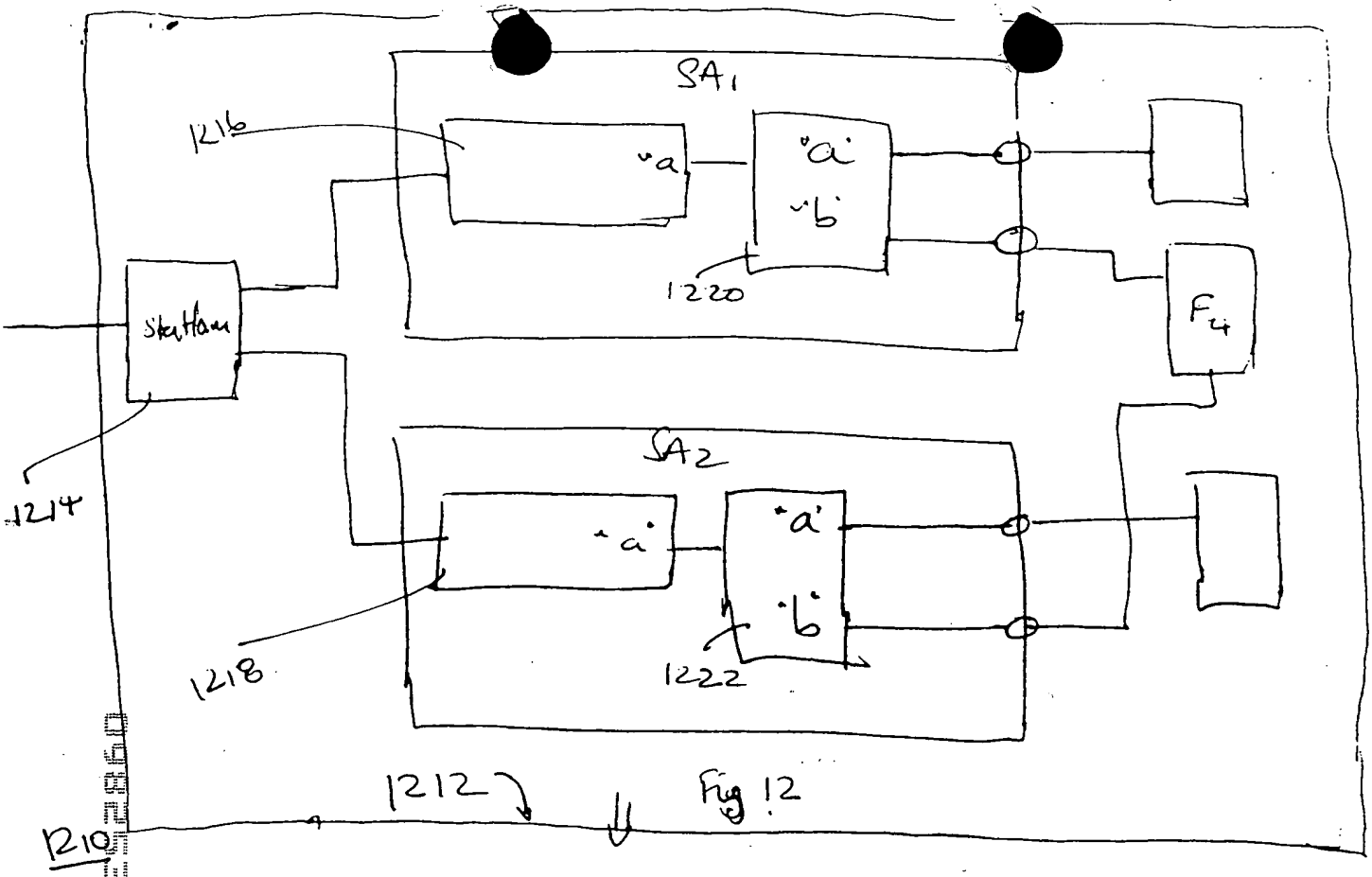
SA1
1216
'a'
'a'
'b'
1220
F4
Skeltham
1214
SA2
'a'
'a'
'b'
1218
1222
1212
1210

Fig 12

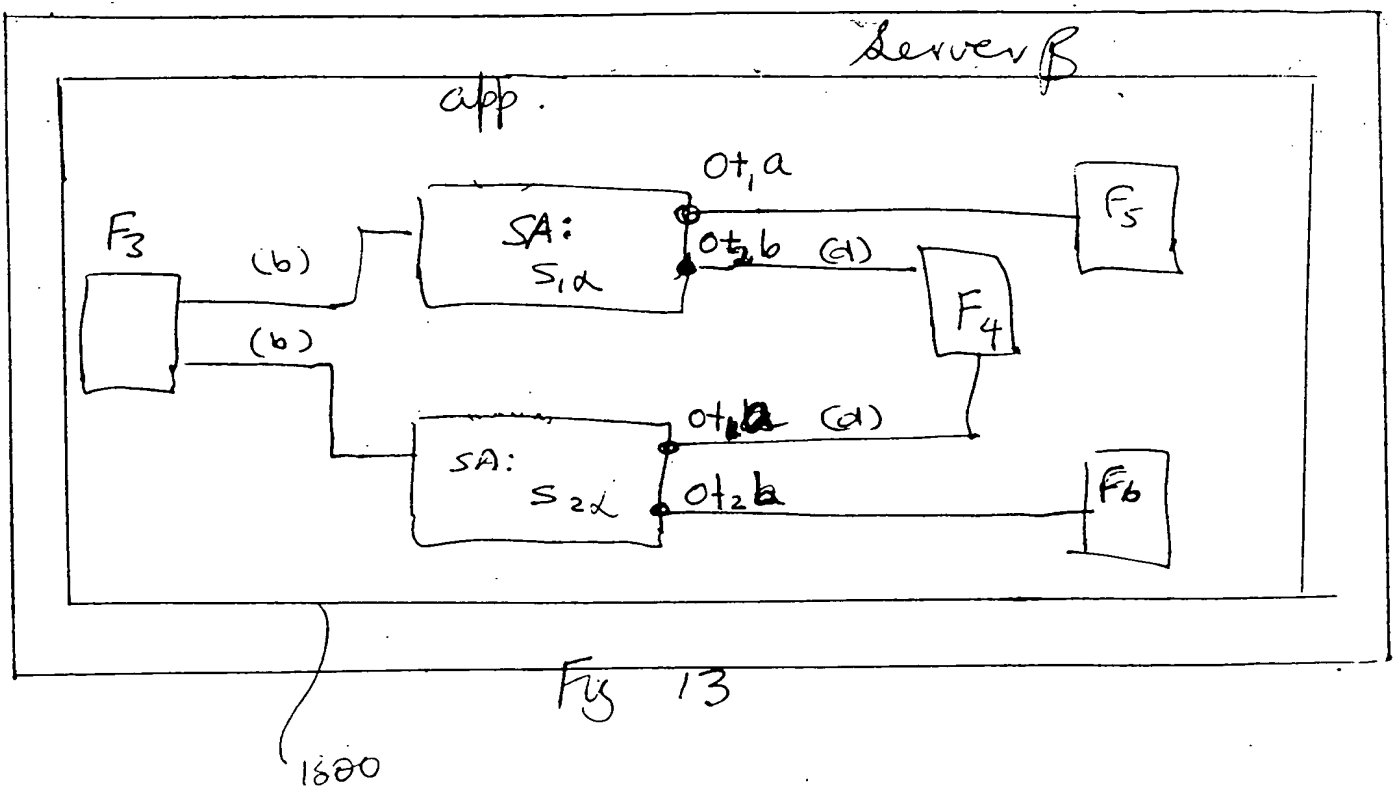
Server β
app.
Ot1a
F3
(b)
SA:
S1a
Ot2b
(a)
F5
F4
(b)
Ot1b
(a)
SA:
S2a
Ot2b
F6
1600

Fig 13

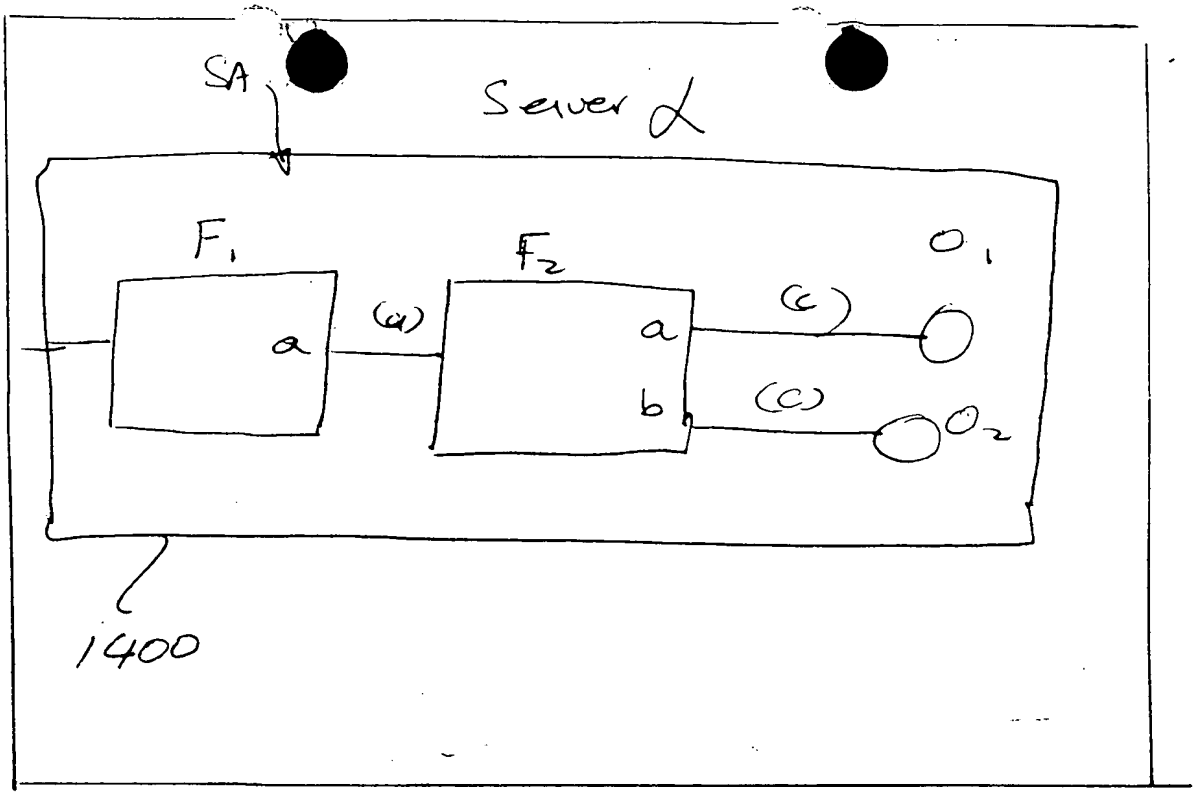

Figure 14.

EP 0 4 0 5 5 2 8 6 0

TOHOHO" 05E52860

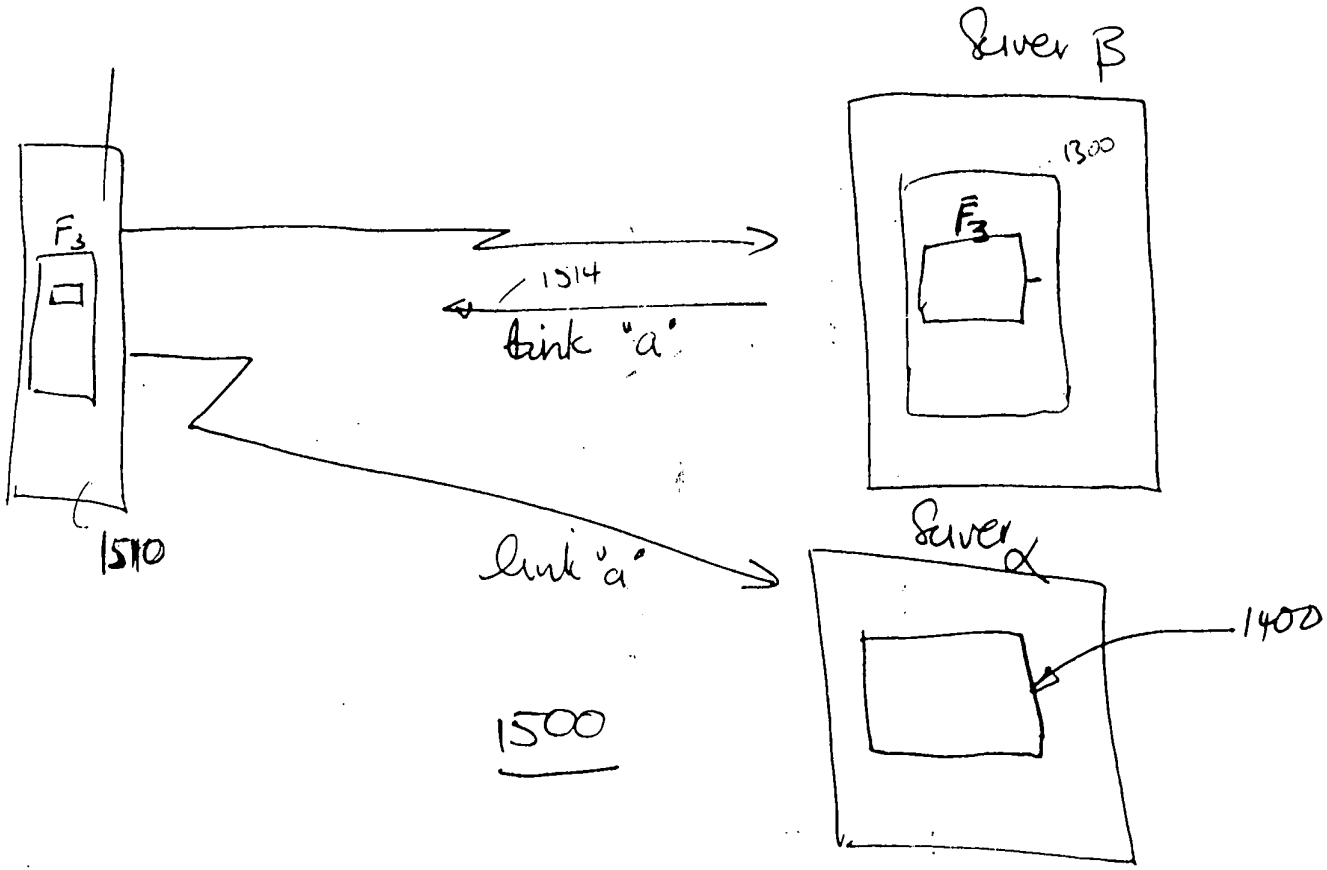

Fig 15

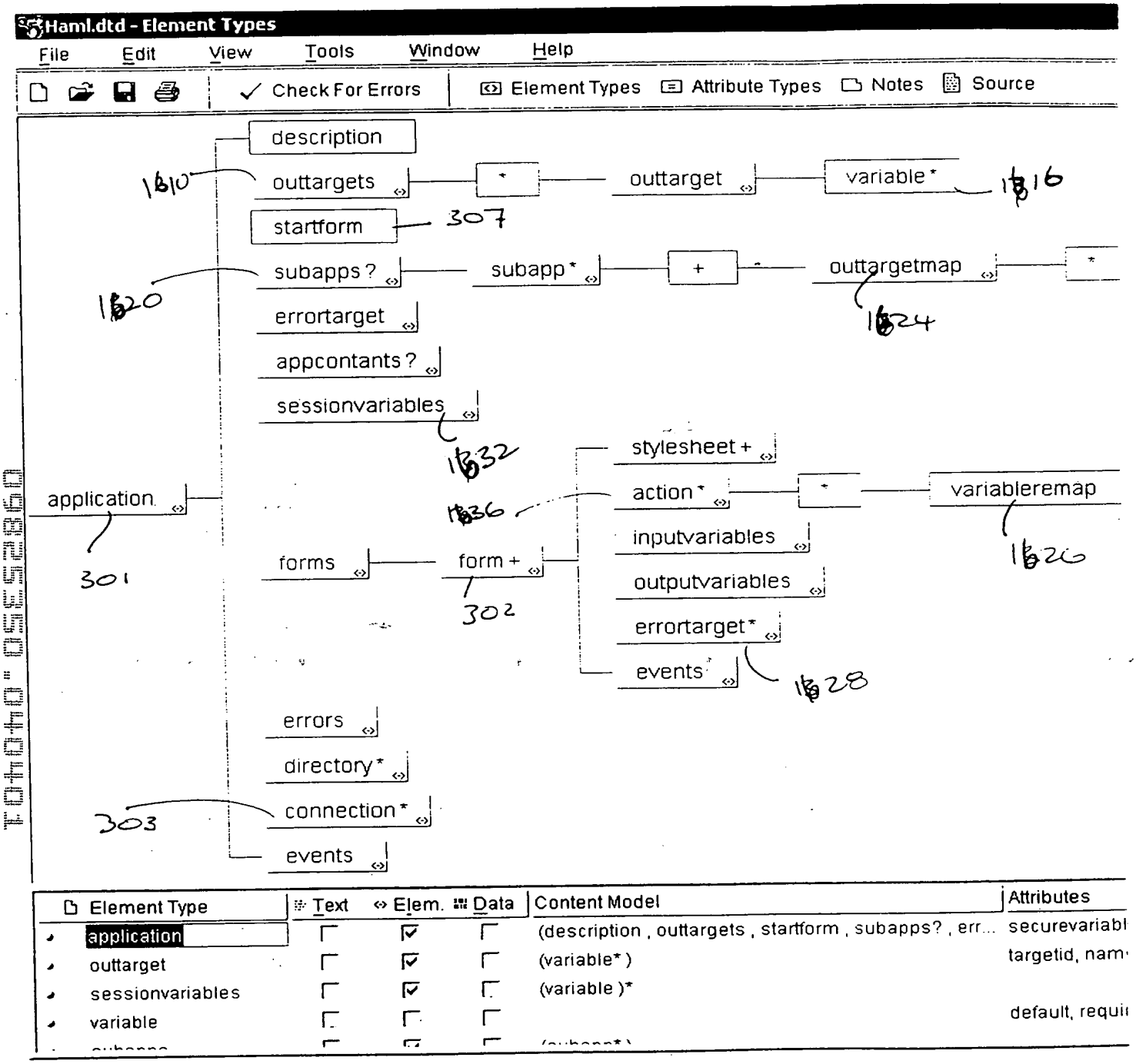
Haml.dtd - Element Types
File Edit View Tools Window Help
Check For Errors
Element Types
Attribute Types
Notes
Source
description
outtargets
outtarget
variable*
1610
1616
startform
307
subapps?
subapp*
outtargetmap
1620
1624
errortarget
appcontants?
sessionvariables
1632
application
301
stylesheet+
action*
variableremap
1636
1626
inputvariables
forms
form+
outputvariables
302
errortarget*
events
1628
errors
directory*
303
connection*
events
Element Type
Text
Elem.
Data
Content Model
Attributes
application
(description , outtargets , startform , subapps? , err...
securevariabl
outtarget
(variable*)
targetid, nam
sessionvariables
(variable)*
variable
default, requi

Figure 16

Receive request

- Determine request signature
    - app
    - targetid
    - language
    - markup
- Add to Runtime XML (RML)
    - Request signature
    - Dictionary element containing the Name/value pairs from request
- Load app
- Pass RML to app
- Process app
    - Find targetid?
        - Subapp
            - Load subapp
            - Pass RML to app
            - Process app
        - Form
            - Generate Action urls and add them to the RML
                - If no cookies
                    - Include all variables
                        - Remap to new names as described in HAML
            - Find a StyleSheet that matches the language and markup requested
            - Process Stylesheet
- If cookies are on and the device supports cookies
    - Build cookie creation instructions for:
        - Out variables in the RML
            - Remap to new names as described in HAML
        - Session variables in the RML
            - Remap to new names as described in HAML
- Return generated markup

Fig 17

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